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**TEACHING PLANETARY SCIENCES TO ELEMENTARY SCHOOL
TEACHERS: PROGRAMS THAT WORK;** Larry A. Lebofsky, Lunar and Planetary Laboratory, University of Arizona 85721 and Nancy R. Lebofsky, Steward Observatory, University of Arizona, Tucson, Arizona 85721

Planetary sciences can be used to introduce students to the natural world which is a part of their lives. Even children in an urban environment are aware of such phenomena as day and night, shadows, and the seasons. It is a science that transcends cultures, has been prominent in the news in recent years, and can generate excitement in young minds as no other science can. Planetary sciences also provides a useful tool for understanding other sciences and mathematics, and for developing problem solving skills which are important in our technological world. However, only 15 percent of elementary school teachers feel very well qualified to teach earth/space science, while better than 80% feel well qualified to teach reading; many teachers avoid teaching science; very little time is actually spent teaching science in the elementary school: 19 minutes per day in K-3 and 38 minutes per day in 4-6.

While very little science is taught in elementary and middle school, earth/space science is taught at the elementary level in *less than half* of the states. It has been pointed out that science is not generally given high priority by either teachers or school districts, and is certainly not considered on a par with language arts and mathematics. Therefore in order to teach science to our youth, we must empower our teachers, making them familiar and comfortable with existing materials.

To address these needs we conducted several workshops for elementary school teachers over the last few years. Teachers were introduced to space science concepts and hands-on activities that they could use in their classrooms.

However, Tucson has another, but not unique, problem. Tucson is a culturally-diverse (about 25% Indian/Black/Hispanic) city with a wide variety of public and private schools. The largest public school district, the Tucson Unified School District (TUSD), provides a neighborhood school system enhanced with magnet, bilingual and special needs schools for a school population of 57,000 students that is 4.1% Native American, 6.0% Black, and 36.0% Hispanic (1991). It is predicted that by the year 2050 the minority population in the U.S. will be approximately 40%. However, in TUSD, the "minority" will be the majority by 1993. In Sunnyside, another of Tucson's largest districts, the minority population is over 75% and the Hispanic population is over 72% (1991). This makes TUSD and the other school districts in and around Tucson and the rest of Pima County ideal for a program that reaches students of diverse ethnic backgrounds.

In our earlier workshops, several of our teachers taught in classrooms where the majority of the students were Hispanic (over 90%). However, few space sciences materials existed in Spanish. Therefore, most of our materials could not be used effectively in the classroom.

To address *this* issue, we have translated NASA materials into Spanish and are conducting a series of workshops for bilingual classroom teachers from Tucson and surrounding cities.

We will discuss in detail our space sciences workshops and our bilingual classroom workshops and how they address the needs of elementary school teachers in Arizona.